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Application Number: 10/611,842
Office Action Date: 09.01.2006Filed: 07.01.2003
Amendment Date: 11/14/2006**Listing of Claims:***This listing of claims replaces all prior versions and listings of claims in the application.*

1. (Currently Amended) A bent tube having a bend configuration comprising:
a curve extending between first and second ends;
a portion of the curve being a circular arc; and
~~a transition portion extending from the circular arc toward the second end and having a curvature decreasing linearly from the curvature of the circular arc to the zero curvature of a straight tube.~~
a clothoid transition portion extending from the second end toward the circular arc having a radius of curvature decreasing from zero curvature to a radius of curvature of the circular arc at a point of integration.
2. (canceled)
3. (Currently Amended) The tube of claim 1 including a second transition portion extending from the arc portion toward the first end having a curvature decreasing from the bending radius of the arc to the zero curvature of the straight tube.
4. (Original) The tube of claim 1 wherein the curve subtends an angle of 90 degrees.
5. (Original) The tube of claim 1 wherein the curve subtends an angle greater than 90 degrees.
6. (Previously Presented) The tube of claim 1 wherein the curve subtends an angle less than 90 degrees.

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7. (Currently Amended) A draw die for tube bending, the die having a bending surface configuration comprising:

a curve extending between first and second ends;

a portion of the curve being a circular arc; and

~~a transition portion extending from the circular arc toward the second end and having a curvature decreasing linearly from the curvature of the circular arc to the zero curvature of a straight tube.~~

a clothoid transition portion extending from the second end toward the circular arc having a radius of curvature decreasing from zero curvature to a radius of curvature of the circular arc at a point of integration.

8. (canceled)

9. (Currently Amended) The draw die of claim 7 including a second transition portion extending from the arc portion toward the first end having a curvature decreasing from the bending radius of the arc to the zero curvature of the straight tube.

10. (Previously Presented) The draw die of claim 7 wherein the curve subtends an angle of 90 degrees.

11. (Previously Presented) The draw die of claim 7 wherein the curve subtends an angle greater than 90 degrees.

12. (Previously Presented) The draw die of claim 7 wherein the curve subtends an angle less than 90 degrees.

13. (Previously Presented) The bent tube of claim 1, wherein the shape and arc length of the transition portion is defined by a length and an angle of the portion of the curve being the circular arc.

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14. (Previously Presented) The draw die of claim 7, wherein the shape and arc length of the transition portion is defined by a length and an angle of the portion of the curve being the circular arc.